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03235-UPS

REMARKS

In the Office Action, claims 1-41 are rejected under 35 U.S.C. §103(a) as being unpatentable over Tu.

The gist of the instant invention is to provide a WDM that is good in automatic alignment, feasible in passive alignment, small in size, and low in production cost. To achieve the foregoing objective, the present invention utilizes the special crystal lattice structure of the silicon wafer, uses a micro lithography and etching process to manufacture specific grooves, and disposes the optical fibers, lenses, and thin-films into the grooves under the passive alignment conditions to manufacture a WDM for both multiplexing and demultiplexing lights. The silicon optic based WDM of the present invention comprises a silicon substrate with grooves, an input optical fiber of incoming port with its front lens, an optical fiber of pass port with its front lens, an optical fiber of reflect port with its front lens, and a thin-film filter. The optical fibers, lenses, and the thin-film filter are inserted into grooves to complete the fiber-to-fiber alignment.

Tu teaches a wavelength division multiplexing transmitter and receiver module using a micromachined silicon substrate for mounting optical components. In the disclosure of Tu, the grooves formed on the substrate are coated with thin dielectric films to form dielectric multi-layered filter 303 and dielectric multi-layered half-mirror 304 for splitting and reflecting lights to the two receivers 311 and 310 (FIG. 3; col. 3, lines 43-52). Applicants respectfully contend that Tu's art can not be practiced because even with today's most advanced technology, coating a thin film on a silicon substrate

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can only create a total reflection thin film. Indeed, the instant invention is provided to overcome the difficulty in manufacturing the device in the art of Tu by coating a thin film on an optical filter and then inserting the thin film filter into the grooves.

Furthermore, the main figure (FIG. 3) of Tu's disclosure is contradictory and inconsistent. In the figure, optical signals travel through the air and the substrate along an optical path of a same optical axis which obviously violates the Snell's law in optics. Refraction due to the different media (air and substrate) would certainly change the optical path shown in FIG. 3 and make Tu's device non-functional.

In response to the office action, claim 1 amended to more particularly claim the subject matter of the present invention in a patentable way to overcome the rejections under 35 U.S.C. §103(a). In particular, claim 1 now specifically includes the limitation that the filter is an external filter inserted in the grooves of the silicon substrate. As discussed above, the cited prior art has taught and suggested a filter distinct with the instant invention. The amended claim 1 should be allowable. By virtue of dependency, claims 2-24 should also be allowable. Claim 25 is also amended in a similar way. As a result, claims 25-41 should also be allowable.

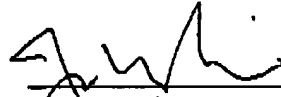
From the foregoing discussion, it is clear that the instant invention differs from the cited prior art. The physical difference results in different effects and is not obvious. The amended claims 1-41 should have overcome the rejection under 35 U.S.C. §103(a) and are now in full condition for allowance. The specification has been amended to correct a

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few editorial and grammatical errors. Prompt and favorable reconsideration of the application is respectfully solicited.

Respectfully submitted,



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